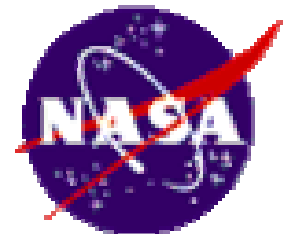
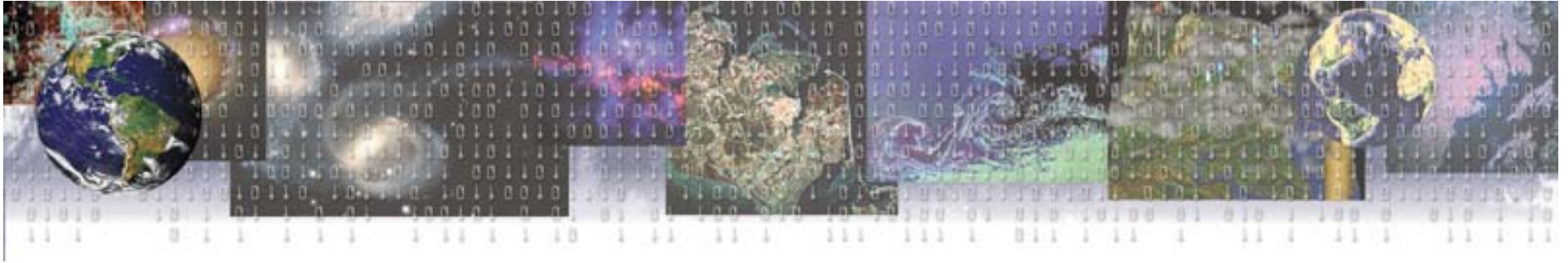


ECHO Development Activities

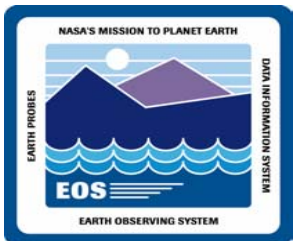


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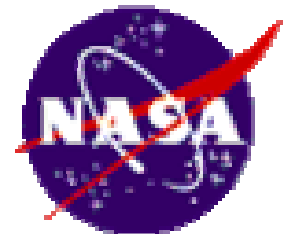




Comparison of ECHO 4.5 to ECHO 5.0



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A Word About Iterative Development

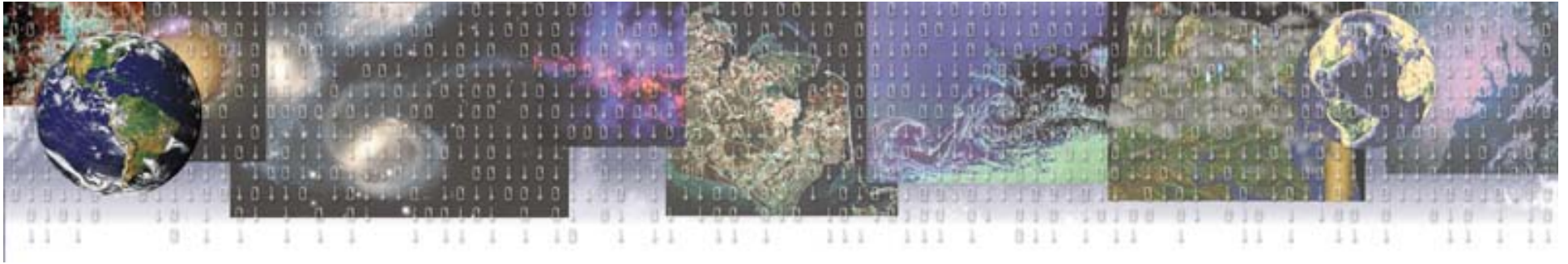
- **Remember that ECHO is developed incrementally**
- **In each release:**
 - New functions may be added
 - Existing functions may be improved



Change in ECHO Unique ID

- Known as ECHO Item ID
- Changed from numeric only field to a string field





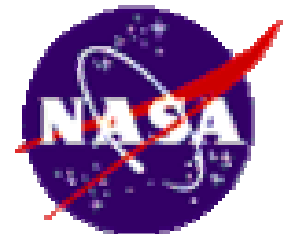
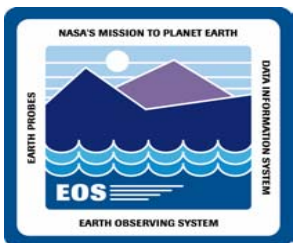
Roles in ECHO



**How to have a split personality and maintain your API...
(A brief description of the roles capability added into
ECHO Version 5)**



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4.5 System Baseline

- **Providers have separate accounts from registered users**
 - One account/password is shared by all provider personnel responsible for managing ECHO
- **Guests do not log in**



Two Types of Users

- **As of ECHO Version 5.0, there are two types of users**
 - **Guest**
 - This is a user of the system who does not call the login method of the Session Manager
 - This user is not guaranteed (or in most cases allowed) persistence of items in ECHO beyond their orders
 - **Registered User**
 - This is a user who has successfully called the login method of the Session Manager with their user id and password
 - This user can save and recall queries, result sets, persist account information, access a list of orders submitted or created but not submitted, etc.
- **Previously, there was a Provider User as well, but they may no longer log into the system**

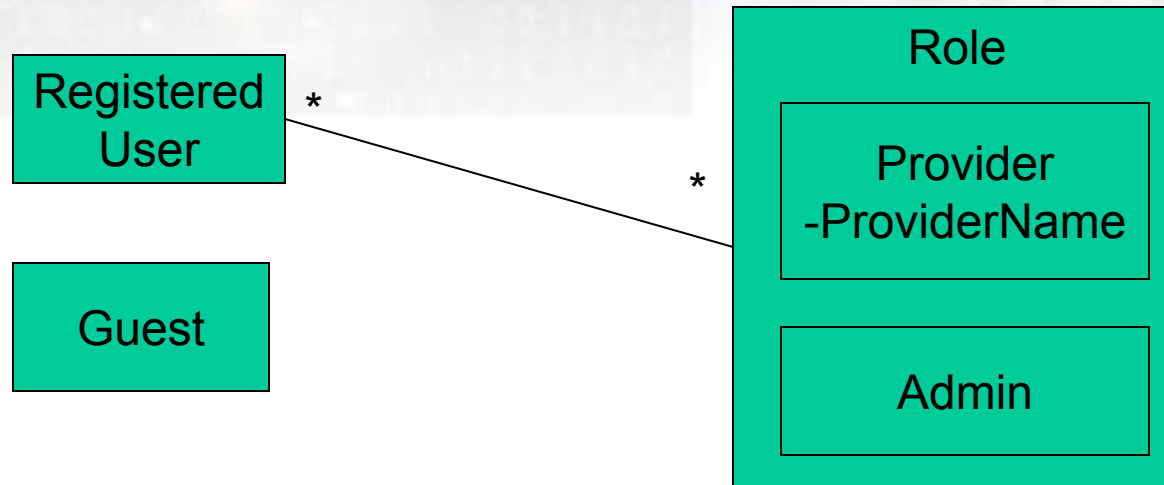


Registered Users May Have Roles

- **Currently, there are two possible types of roles that may be given to a Registered User**
 - Note: A Registered User does not HAVE to have any roles
 - **Administrator**
 - A User with this role can access additional transactions that allow them to act as any user, delete users, and allow them to see any order. It does not allow them access to data that has been hidden via the DMS unless they act as a user that has access.
 - **Provider**
 - A User with this role can access additional transactions that allow them control over the Provider Account since no one can log in as the Provider anymore.
 - Provider Account Service
 - Provider Order Management Service
 - Data Management Service



Role



- A Registered User can have many Roles, including Administrator, and Provider for any number of Registered Providers
- A Guest User cannot have any Roles



Administrator Role

- Once logged in, a User with this role acts as them self until they do a change context operation.
- If the user performs a change user context, then future transactions will operate as if the administrator is the user they changed context to
 - The ECHO log files will show both the administrator's login name and the user they are acting as so that a record is maintained of who actually performed a function
- If the administrator user performs a change provider context, then they will be allowed to access Provider only transactions, and will act as the specified Provider
 - An admin user can change to any Provider



Provider Role

- **A User may have multiple Provider Roles, one for each Provider that they represent**
 - For instance, EDC has two separate data centers that they operate which may share personnel
- **Once a user has any Provider Role, then they are allowed to access additional service transactions**
 - If a user has exactly one Provider Role, then ECHO will use that Provider whenever a Provider Transaction is executed
 - If a user does not have exactly one Provider Role, then they must run the SetProviderContext method on the Session Manager to let ECHO know which Provider they are acting on the behalf of when they execute a Provider Transaction
 - Note: If a User has the Admin role, they can use SetProviderContext to become any Provider. If they have exactly one Provider Role in addition to the Admin Role, then they will not need to call SetProviderContext to act on behalf of that Provider. If they have more than one Provider Role, then they must call SetProviderContext



The Session Manager

- **The Session Manager is the object that any ECHO client talks to**
 - It maintains what user is currently using it
- **Session Manager has several methods:**
 - Login(UserID,Password)
 - Establishes which user is associated with the session
 - Logout()
 - Become a guest user again
 - Perform(XMLString):XMLString
 - How Service Transactions are called
 - Identify(String)
 - Associates a string that represents the client (e.g. EDG v3.8) that gets logged with the user information
 - SetProviderContext(ProviderName)
 - Allows a user that has multiple Provider Roles to select which Provider they are representing
 - SetUserContext(UserID)
 - Allows an administrator user to select which user they are acting as



Metadata Update Capability

- **Currently in 4.5, ECHO uses the ingest mechanism to insert, update and delete both collection and granule metadata**
 - Each collection or granule is updated as a whole
- **The Metadata Update capability allows certain fields to be updated independently of the rest of the granule**
 - In 5.0, this works for OnlineURL (for Data Pools) and QA flags only
 - The ECHO last update flag is updated appropriately
 - The Provider last update flag is updated according to the request



Catalog Service Changes

- **GetMetadata transaction**

- Used to get metadata from ECHO without having to first do a query
- Requires the ECHO unique identifier for a granule or collection

- **Query transaction**

- New result type: ITEM_IDS
- Returns only the ECHO unique identifier
- No result set is created

- **Explain Search Parameter**

- Also referred to as dynamic valids
- Ability to find out what valid values exist in the database for a particular query attribute
 - Can be focused using a query



Order Entry Service

- **Set Authentication Key added**
 - Allows an authentication key to be added to a provider order
 - Not currently used when communicating with provider???
- **PresentOptionDefinitionsForProviderOrderRequest (ProviderOrderID) changed**
 - Changed to: PresentOrderOptionDefinitionsForProviderRequest (ProviderID)
- **SetOptionSelectionsForProviderOrderRequest (ProviderOrderID, OptionSelection+) changed**
 - Changed to: SetProviderOptionSelectionsForProviderOrderRequest (ProviderOrderID, OptionSelection+)
- **SetProviderOptionSelectionsForProviderOrderRequest (ProviderOrderID, OptionSelection+) added**
 - Added to allow checking what order options have already been set at the provider order level



OES Continued

- **Submit Order modified**

- 4.5: Notification Mechanism: none or email
- 5.0: Notification Level: Verbose, Detail, Info, Critical, None
 - Verbose: All state changes, status updates, and error messages
 - Detail: State changes and error messages
 - Info: State changes to closed or cancelled, and error messages
 - Critical: Error messages or rejection
 - None: No email sent
- A User Preference has been created to be the default Notification Level (default for guest is Verbose)



Provider Account Service

- **Added role management functions**
 - Grant Provider Access
 - Revoke Provider Access
- **Present Provider Info**
 - Now returns the Provider ID needed to query the system



Provider Order Management Service

- The infrastructure of ECHO was improved to allow the use of ORs in the API
- Several functions needed either a **ProviderTrackingID** or an **OrderID**
 - They have been updated so that the OR is used appropriately
- **PresentOpenOrder**, **PresentOpenOrderSummary**, **PresentClosedOrder** and **PresentClosedOrderSummary** changed to allow specification of order state as a filter



Subscription Service

- **ListPausedSubscriptions**
 - Allows a user to list any of their subscriptions that they have previously paused
- **FTP defaults to passive mode**



User Account Service

- Changed CancelOrder to use the new API OR capability to express OR condition between Order ID and Provider Order ID
- ChangeUserPassword modified to allow an administrator to change a user's password without knowing the current password
- ListRoles function added to identify all roles granted to a user
- Added UserName to PresentUserInformation response



New User Preferences

- **Default notification level for orders**
- **Default shipping address**
 - Clients can use this to reference the address book for the address to use
- **Default billing address**
- **Default contact address**



Administration Service

- Added administration capabilities to the system



Provider Profile Service

- **ListAllProviders**
 - Allows a user to find out what Providers participate in the system
- **PresentProviderProfiles**
 - Gives access to Provider Contact information, description of holdings, spatial projection type and organization name
- **PresentProviderSupportedTransactions**
 - List of transactions that a provider actually participates in
 - Order, Quote, Cancel



New Provider Policies

- **Configuration of ECHO-> Provider communication parameters**
 - What server and port to talk to
 - What protocol to use (ODL or SOAP)
 - What transactions are supported (Quote, Order, Cancel)



The Facade

- Set of Java classes that encapsulate all communication with ECHO
- Client developer only needs to use XML when creating queries, and interpreting results
- Utilizes SOAP interface to ECHO
 - No knowledge of SOAP needed



New GUIs

- **PUMP**

- Access to provider account information, group management, ACL management, role management, and user account information
- Creation of registered users, provider applications

- **Subscription Service GUI**

- Management of metadata subscriptions

- **Provider Application GUI**

- Convenient place to fill out provider application form

- **Provider Policies GUI**

- Convenient place to discover and set provider policies



GUI Modifications

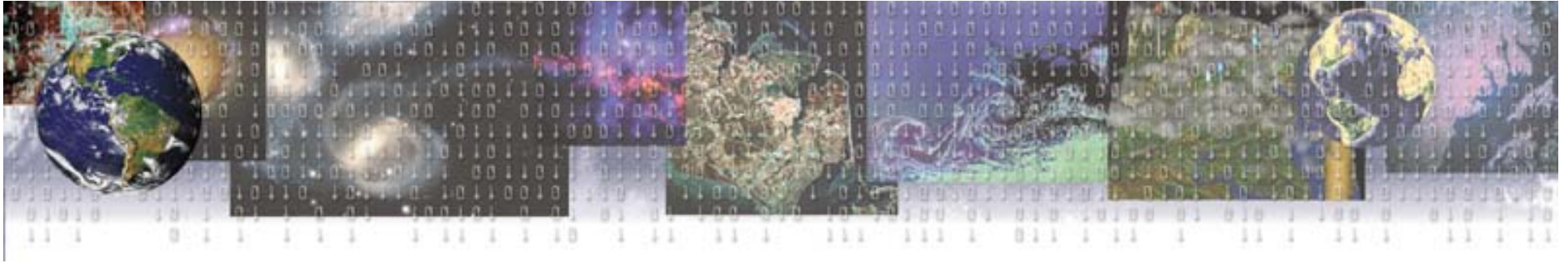
- All GUIs use the façade
- Added user and provider context setting capabilities to test harness
- Added ability to point GUIs at any ECHO server
 - This accommodates test installations of ECHO in addition to the operational one



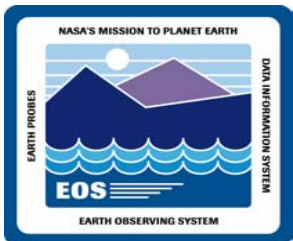
ECHO 5.5 Overview

- **Services**
- **Inspection Functions**
- **Ingest Improvements**
- **Collection Based Search**
 - Backtrack Algorithm
- **DMR Changes**

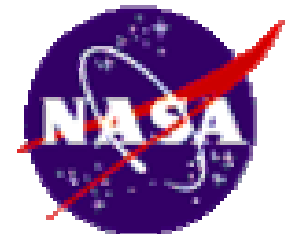




Access Control Lists in ECHO



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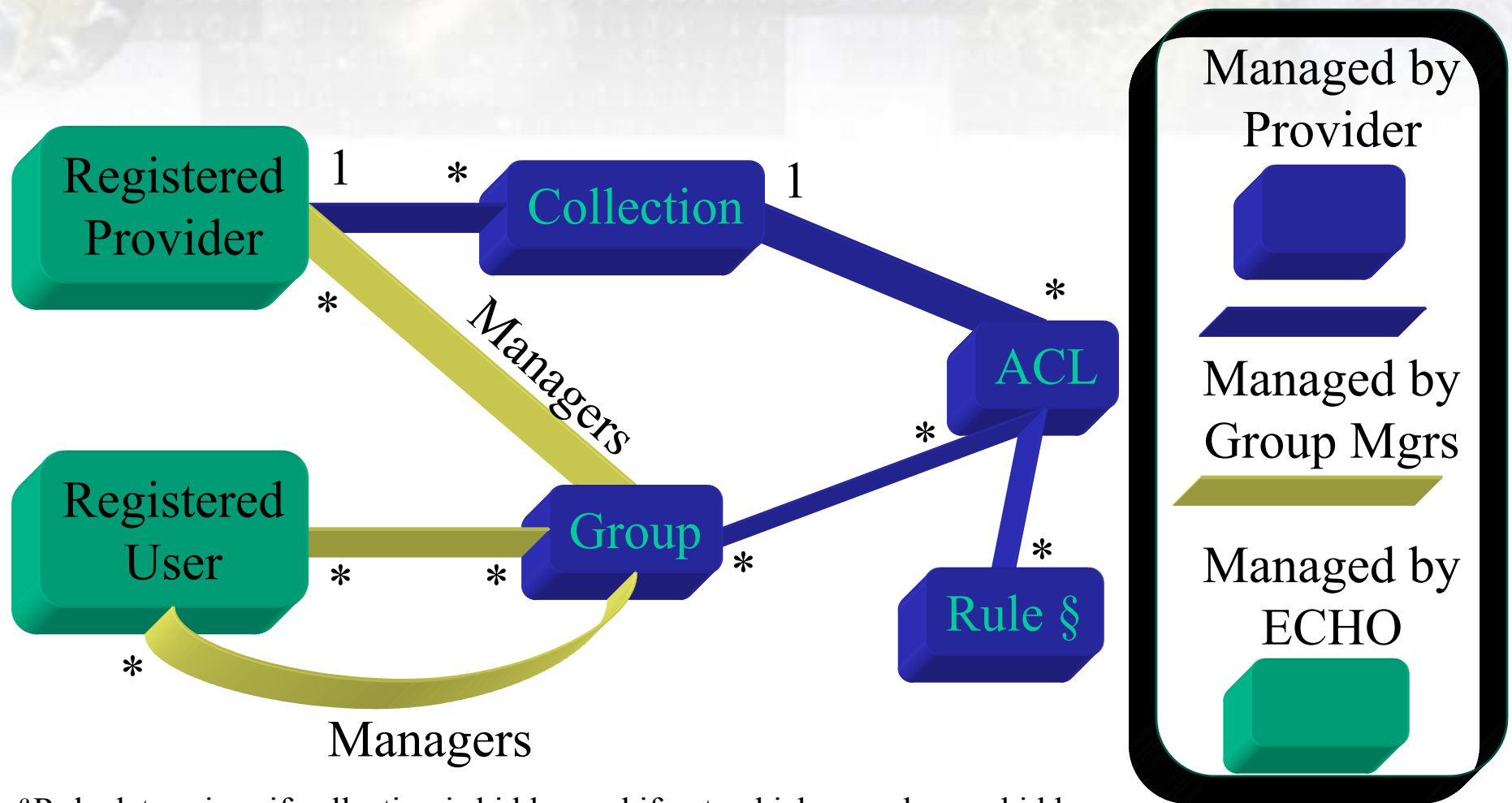


Purpose of ACLs

- **Originally ECHO was intended to be a clearinghouse of public metadata**
 - ECHO can now also serve as a clearinghouse for restricted (private) metadata
- **Desire in provider community to use a single system to represent their metadata**
- **Also a desire to leverage user interfaces developed for ECHO for those who have access to restricted (private) metadata.**



Metadata Visibility - Conceptual Model



§Rule determines if collection is hidden and if not, which granules are hidden



Key Concepts

- **Managers**
 - A list of users and/or providers
 - Can add or remove other managers
 - Can add or remove members of the group
 - Can contact the members or managers
- **Members**
 - A list of users and/or providers
 - Can contact other members
- **Real use: Metadata Visibility Permissions**

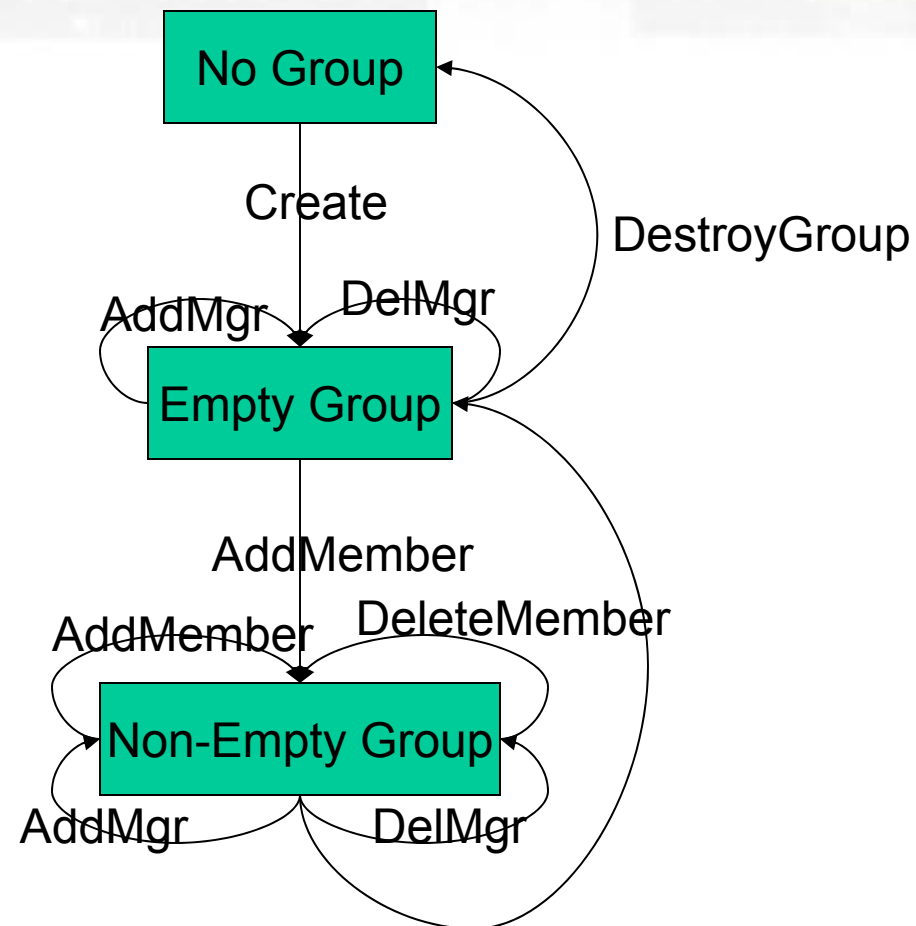


Why do we have groups?

- **Mechanism for aggregating users**
- **Communication**
- **Metadata Visibility**



Group State Machine



Group Management Service GUI

- Allows customers to manage groups
 - Group Managers
 - Group Members
- Managers can also contact group members

Group Administration

Group Information

Group Name:

Science Team

[Destroy Group](#)

Group Description:

My Science Team

Group Managers:

	User Name	Full Name
<input type="checkbox"/>	blunck2	Christopher Blunck
<input type="checkbox"/>	TEST_PROVIDER1	Joe Provider
<input type="checkbox"/>		
<input type="checkbox"/>		

[Check All](#) - [Clear All](#) - [Delete Checked](#) Showing 1 - 2 of 2

Group Members:

	User Name	Full Name
<input type="checkbox"/>	wichmann	Keith Wichmann
<input type="checkbox"/>		
<input type="checkbox"/>		
<input type="checkbox"/>		

[Check All](#) - [Clear All](#) - [Delete Checked](#) Showing 1 - 1 of 1

Update Group



Group Caveats

- There can be multiple managers
- Any manager can add or remove other managers
- Managers are not automatically members of the group
- An owner has no control over the group, it is simply an attribute of the group that stores who originally created the group
 - The owner will also be the first manager of a group if the group was created without specifying a manager



Data Management Service

- Used by providers to manage access control to their metadata and ordering processes
- Composed of Rules, Conditions and Groups
- Rules and Conditions combined are used to specify subsets of a collection to which to apply access control



ACL Approach

- **When do changes to ACLs take effect?**
 - In short, immediately (no batch updates needed)
 - The system is designed around the concept of provider control, and a provider's update is honored immediately in all ECHO transactions
- **Access Control Lists are honored at time of execution allowing a provider to make updates that will apply to existing result sets and orders**
 - This allows the provider to introduce new restrictions, remove existing restrictions, or arrange for a group to be updated
- **Certain types of restrictions are time-based and will expire automatically**
 - An ACL will allow access to a previously restricted result set when a temporal restriction expires
 - Does not require a provider to take an action



What access is being controlled?

- **Viewing**

- Catalog Service and Subscription Service will prevent the presentation of controlled metadata
- CAVEAT: Once a copy of the metadata is extracted from ECHO, it can be shared at will circumventing ECHO's access control functions exactly as is possible currently by ordering provider data and sharing with others
- CAVEAT: Browse URLs that are part of the ECHO metadata are controlled in the sense that they are not presented if the metadata is not visible, but access is not checked for every client that accesses the URL directly

- **Ordering**

- Order Entry Service prevents
 - Creation of orders with a restricted item
 - Adding restricted items to an order
 - Quoting orders with a restricted item
 - Submitting an order with a restricted item

- **Browse**

- Browse has been discussed as being a separately controlled item, but is currently considered too complex



What is the granularity of control?

- **Collections**

- Metadata Visibility: A collection's entire metadata description as well as all contained granules
 - CAVEAT: In the future, we plan to expose the name of the collection regardless of its access control state
- Order: A collection or the granules within the collection

- **Granules**

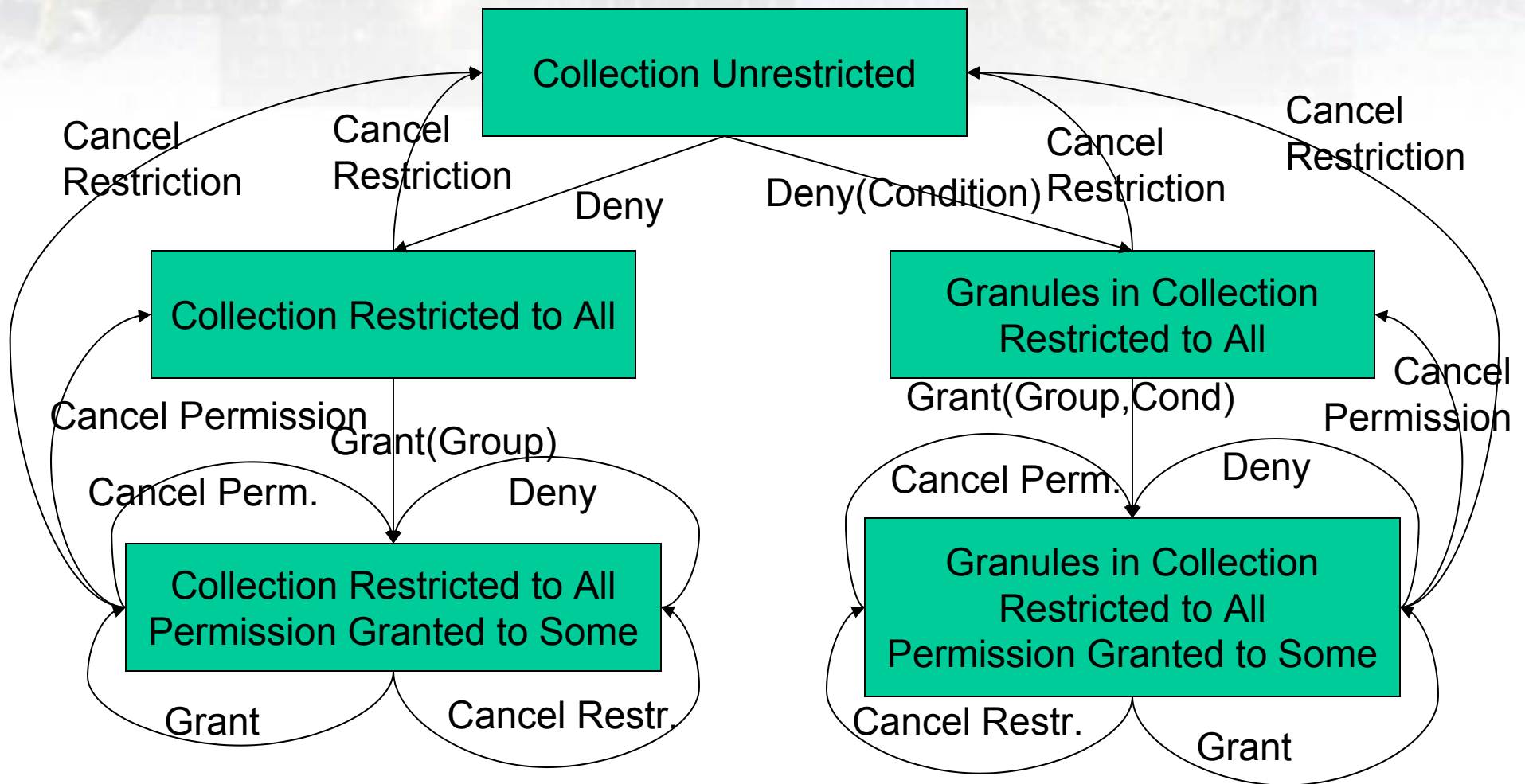
- An individual granule can be controlled by naming its Provider GranuleUR
- This is discouraged except when it is very few granules affected

- **Subsets of Granules within a Collection**

- Frequently it is useful to specify groups of granules within a collection by some common attribute to protect
- Subsets can be performed based on Time of Acquisition
 - Fixed time periods or rolling time periods can be used
 - Future: Subsets can be performed based on a provider controlled access flag, which can be set according to quality concerns, spatial location, etc.



DMS State Machine



Data Management Key Components

- **Conditions**

- Temporal
- Rolling Temporal
- Boolean

- **Rules**

- Restrictions
- Permissions

- **Groups**

- Only used with Permissions



Conditions - What are They?

- **Phraselets (unable to be evaluated)**
 - Temporal
 - Start: Sept 1, 2002
 - Stop: Sept 31, 2002
 - Rolling Temporal
 - 30 days
 - 10 years
 - Boolean
 - True
 - False



Evaluating Conditions - Comparators

- **Comparators + Conditions = Evaluation Mechanism**
- **Examples of Comparators**
 - <, >, <=, >=, ==, !=
- **How they are used**
 - Comparator: ==
 - Temporal Condition: start Sept 1, 2002; stop Sept 30, 2002
 - Result: The time frame between September 1, 2002 and Sept 30, 2002
- **Questions**
 - How would this be evaluated with a != comparator?
 - Does a < comparator make sense in this context?



Rules

- **Provider-Only access**
- **References**
 - Condition and Comparator
 - Provider
 - Granule or Collection
 - Group (optional)
- **Types of Rules**
 - Restriction (does not use a Group)
 - Permission (requires a Group)



Restrictions

- A form of a rule
- Prevents access to metadata
- Applies to all ECHO users
- Specific to an Action
 - Actions: View or Order
- Specific to a piece of metadata
 - Collection MOD01
 - Granule SC:1234



Permissions

- A form of a rule
- Enables access to metadata
- Applies to a group previously created
- Specific to an Action
 - Actions: View or Order
- Specific to a piece of metadata
 - Collection MOD01
 - Granule SC:1234



Restriction Example

- **Desired Behavior:** A provider wishes to prevent viewing of all “young” collections.
- **Condition Information**
 - ConditionType: Rolling Temporal
 - Duration: 30 Days
- **Rule Information**
 - RuleType: Restriction
 - Comparator: Less Than
 - DataType: Collection
 - DataValue: “ALL”



Permission Example

- **Desired Behavior:** A provider wishes to grant viewing access to their internal testers
- **Condition Information**
 - Condition Type: Boolean
 - Value: True
- **Rule Information**
 - RuleType: Permission
 - Comparator: Equals
 - DataType: Collection
 - DataValue: "ALL"
 - Group: Internal Testers



Data Management Service

(Conditions)

- Condition Management is separate from Data Rule Management
- Shows how to create a globally true condition.

Boolean Condition View	
Condition Type:	Boolean Condition
Condition Name:	Global True
Condition Description:	Global True
Value of Flag:	True
Delete Condition	



Data Management Service (Conditions)

- Shows how to create a condition based on the temporal time frame of September, 2001

Temporal Condition View			
Condition Type:	<input type="text" value="Temporal Condition"/>		
Condition Name:	<input type="text" value="September 2001"/>		
Condition Description:	<input type="text" value="The month of September 2001"/>		
Start Date:	<input type="text" value="September"/>	<input type="text" value="1"/>	<input type="text" value="2001"/>
Stop Date:	<input type="text" value="October"/>	<input type="text" value="1"/>	<input type="text" value="2001"/>
<input type="button" value="Delete Condition"/>			



Data Management Service

(Restrictions)

- Restrictions apply to all users.
- Restrictions are evaluated using a Condition and Comparator
- Restrictions can apply to a particular granule, or all granules (if blank)

Data Administration	
Rule Name:	September 2001 Blockout
Description:	Our sensor transmitted bad data for the month of September, 2001. As such, we're restricting everyone's access to the data.
Condition:	September 2001
Comparator:	Equals
Type of Action:	(All actions)
Type of Rule:	Restriction
Group: (This only applies to permissions)	foo
Type of Data:	Granules
Data Value: (Leave blank for all data)	
<input type="button" value="Enforce Rule"/>	



Data Management Service

(Permissions)

- Permissions apply to a particular group
- Permissions can only use Boolean conditions
- Permissions can apply to a particular granule, or all granules

Data Administration	
Rule Name:	Science Team Permission
Description:	Allows members of my Science Team to view all the granules I have produced.
Condition:	Global True
Comparator:	Equals
Type of Action:	Viewing
Type of Rule:	Permission
Group: (This only applies to permissions)	Science Team
Type of Data:	Granules
Data Value: (Leave blank for all data)	
<input type="button" value="Enforce Rule"/>	



Visibility “Gotcha’s”

- **Rules evaluated optimistically**
 - Permissions supercede Restrictions
- **Rules short-circuit**
 - “ALL” DataValue keyword short-circuits individual DataValues
 - As soon as permission is located, visibility is granted
- **Conditions are re-usable**
- **Group management an external process**
- **It is possible using both the GUI and API to create ACLs that make no sense**

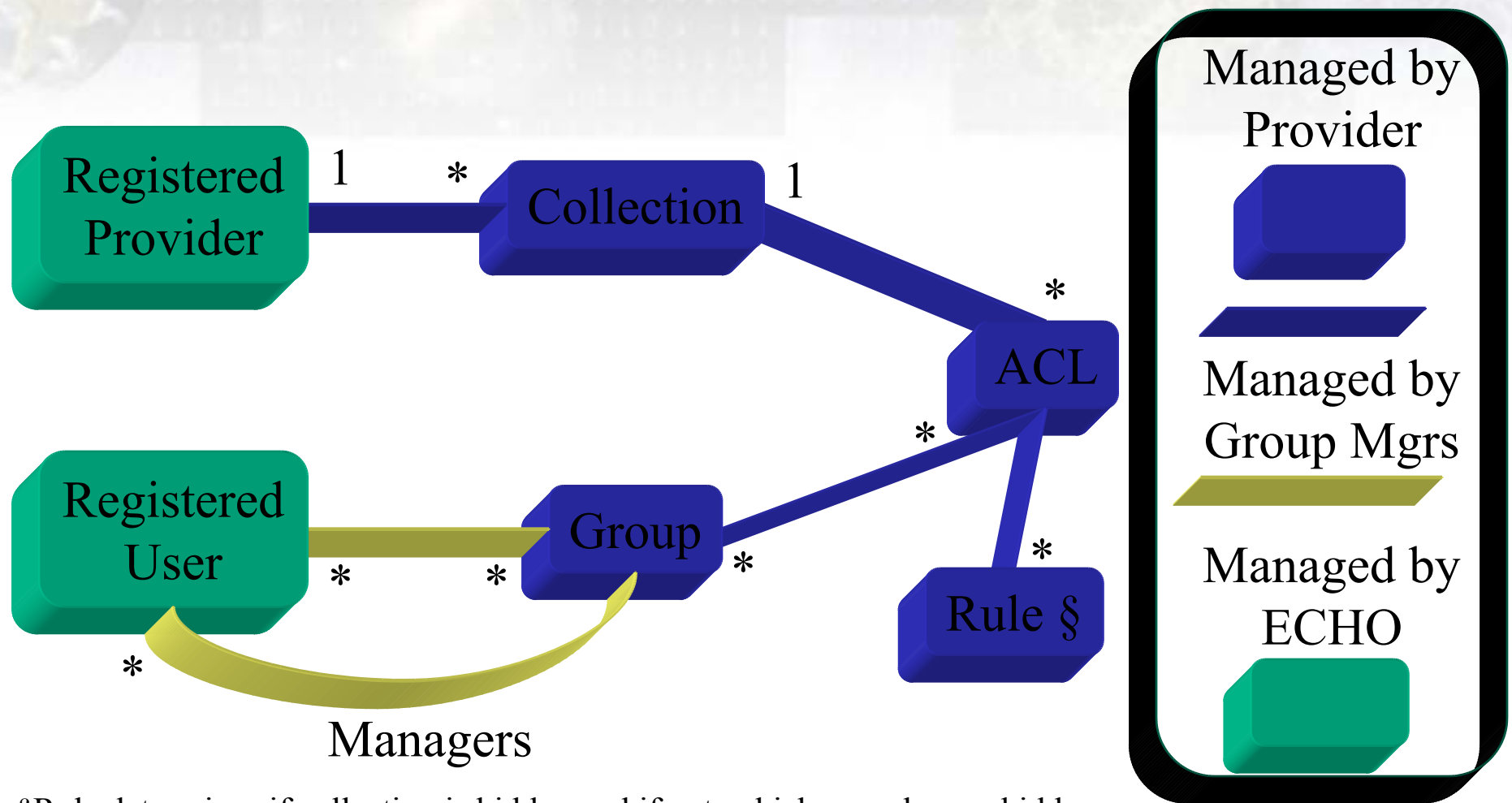


5.0 Improvements

- **Providers are no longer users who log in**
 - Registered users have provider role
- **Management of groups is now limited to registered users**
- **New easier to use user interface**

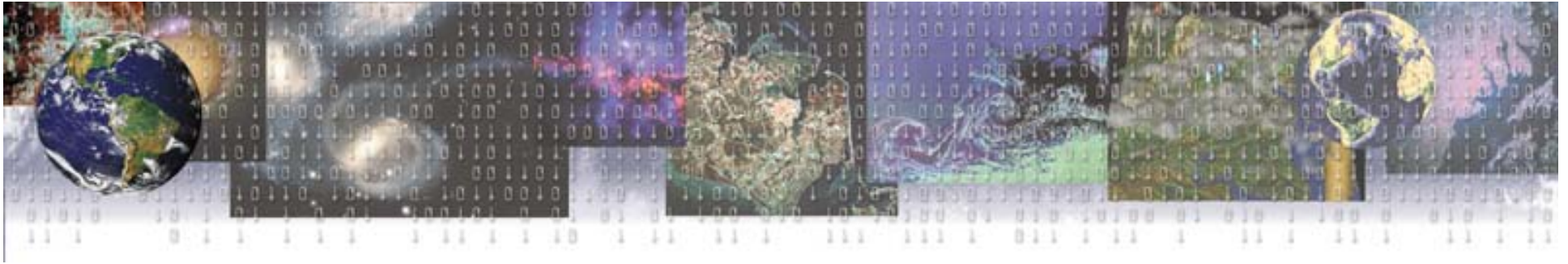


Metadata Visibility - Conceptual Model

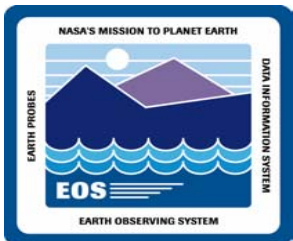


§Rule determines if collection is hidden and if not, which granules are hidden

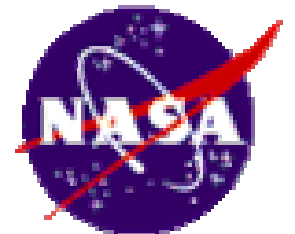




PUMP



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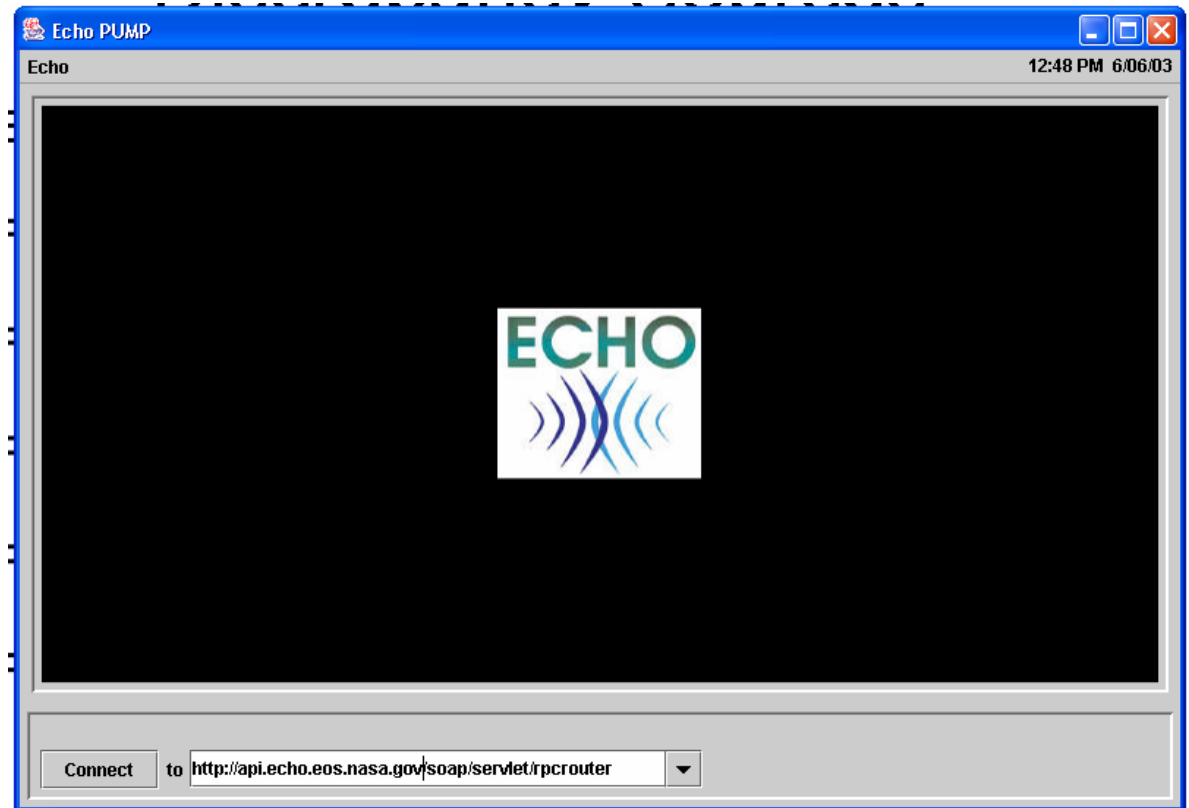
PUMP Attributes

- **PUMP - The Provider User Management Program**
- **Java application**
 - Installs with install anywhere COTS product
- **Addresses providers and administrators needs**
 - Account Management
 - User Management
 - ACL Management
 - More to come...



PUMP Connection

- Specify which instance of ECHO to connect to
 - Allows connection to “test” instances of ECHO



PUMP - First Step - Guest Context

- After connecting to an instance of ECHO, the user can:
 - Register a user
 - Register a provider
 - Login
 - Disconnect
- Pane on left allows user to select functions
- Pane on bottom monitors connection and context
- Main pane shows panels customized to the selected function



User Registration

- Creates user with initial mailing address and phone number
 - Others can be added later
 - All fields are required by PUMP except extension

Echo PUMP

Echo 12:53 PM 6/06/03

☒ User Registration
☐ Provider Registration

Account Information
User Name Password Confirm Password

User Information
User Name ☐ Optin
First Name Last Name
Email Address
Organization

Mailing Address
Address ID (work, home, etc.) ☒ US Format
Address
City State Zip Code Country

Phone Number
Phone ID (work, home, etc.)
Country Area Code Exchange Number Extension

Register

Connected to beamish.gsfc.nasa.gov:4800.
Login as user with password Disconnect



Provider Application Registration

- When a new provider wants to participate in ECHO, this form is used to indicate their holdings and contact information

The screenshot shows a web application window titled "Echo PUMP". The window has a blue header bar with the title and standard window controls. Below the header, the main content area is divided into two sections. On the left, there are two radio buttons: "User Registration" (unselected) and "Provider Registration" (selected). The right section contains a form with several fields: "Organization", "Description of Holdings", "Description of Services", and "Additional Information". Below these is a "Contact" section with fields for "First Name", "Last Name", "Role", and "Email Address". This is followed by a "Mailing Address" section with a large "Address" field, a "City" field, a "State" field, a "Zip Code" field, and a "Country" field. There is also a "Phone Number" section with fields for "Country", "Area Code", "Exchange", "Number", and "Extension". A "Register" button is located at the bottom of the form. At the bottom of the window, there is a status bar that says "Connected to beamish.gsfc.nasa.gov:4800." and a login section with a "Login" button, a text input for "as user", a text input for "with password", and a "Disconnect" button.

Echo PUMP

Echo 12:55 PM 6/06/03

☐ User Registration
☒ Provider Registration

Organization
Description of Holdings
Description of Services
Additional Information

Contact
First Name Last Name
Role Email Address

Mailing Address
Address
City State Zip Code Country

Phone Number
Country Area Code Exchange Number Extension

Register

Connected to beamish.gsfc.nasa.gov:4800.

Login as user with password Disconnect



Main User Context

- These are the functions available to all registered users
- User roles are listed
- Ability to update name, organization, opt-in, and email

The screenshot shows the 'Echo PUMP' application window. The title bar includes the application name and standard window controls. The main window has a menu bar with 'Echo' and a status bar showing '2:40 PM 6/06/03'. On the left is a sidebar with radio buttons for 'User Information' (selected), 'User Addresses', 'User Phone Numbers', 'User Options', 'User Management', and 'Group Management'. The main content area is divided into two sections: 'Account' and 'Roles'. The 'Account' section displays the user's name 'kwichma', full name 'Keith Wichmann', organization 'GST', email 'wichmann@gst.com', and 'Optin: no', with an 'Update' button below. The 'Roles' section displays 'Provider Access to provider GSFC-ITEST'. At the bottom, a status bar indicates 'Connected to beamish.gsfc.nasa.gov:4800, logged in as "kwichma"'. Below this are buttons for 'Set', 'provider' (dropdown), 'context to' (dropdown), 'GSFC-ITEST' (dropdown), 'Change Password', 'Logout', and 'Disconnect'.



Manage User Addresses

The screenshot shows the 'Echo PUMP' application window. The title bar includes the application name and standard Windows window controls. The main window has a menu bar with 'Echo' and a status bar showing '2:41 PM 6/06/03'. On the left is a sidebar with radio buttons for 'User Information', 'User Addresses' (selected), 'User Phone Numbers', 'User Options', 'User Management', and 'Group Management'. The main area contains a dropdown menu set to 'work', an address field with the text '7855 Walker Drive', '2nd Floor', and 'Greenbelt, MD 20770 USA', and three buttons: 'Add', 'Update', and 'Delete'. At the bottom, a status bar indicates 'Connected to beamish.gsfc.nasa.gov:4800, logged in as "kwichma"'. Below this are controls for 'Set', 'provider' (dropdown), 'context to' (dropdown set to 'GSFC-ITEST'), and buttons for 'Change Password', 'Logout', and 'Disconnect'.

Echo PUMP

Echo 2:41 PM 6/06/03

☐ User Information
☒ User Addresses
☐ User Phone Numbers
☐ User Options
☐ User Management
☐ Group Management

work ▼

7855 Walker Drive
2nd Floor
Greenbelt, MD 20770 USA

Add Update Delete

Connected to beamish.gsfc.nasa.gov:4800, logged in as "kwichma".

Set provider ▼ context to GSFC-ITEST ▼ Change Password Logout Disconnect



Manage User Phone Numbers

The screenshot shows the 'Echo PUMP' application window. The title bar includes the application name and standard window controls. The main interface has a sidebar on the left with radio buttons for 'User Information', 'User Addresses', 'User Phone Numbers' (which is selected), 'User Options', 'User Management', and 'Group Management'. The main content area features a dropdown menu set to 'work', a text field containing the phone number '+1 (240) 542-1117', and three buttons labeled 'Add', 'Update', and 'Delete'. At the bottom, a status bar indicates the connection to 'beamish.gsfc.nasa.gov:4800' as user 'kwichma'. Below this, there are controls for setting the provider and context (currently set to 'GSFC-ITEST'), and buttons for 'Change Password', 'Logout', and 'Disconnect'.

Echo PUMP

Echo 2:42 PM 6/06/03

☐ User Information
☐ User Addresses
☒ User Phone Numbers
☐ User Options
☐ User Management
☐ Group Management

work ▼

+1 (240) 542-1117

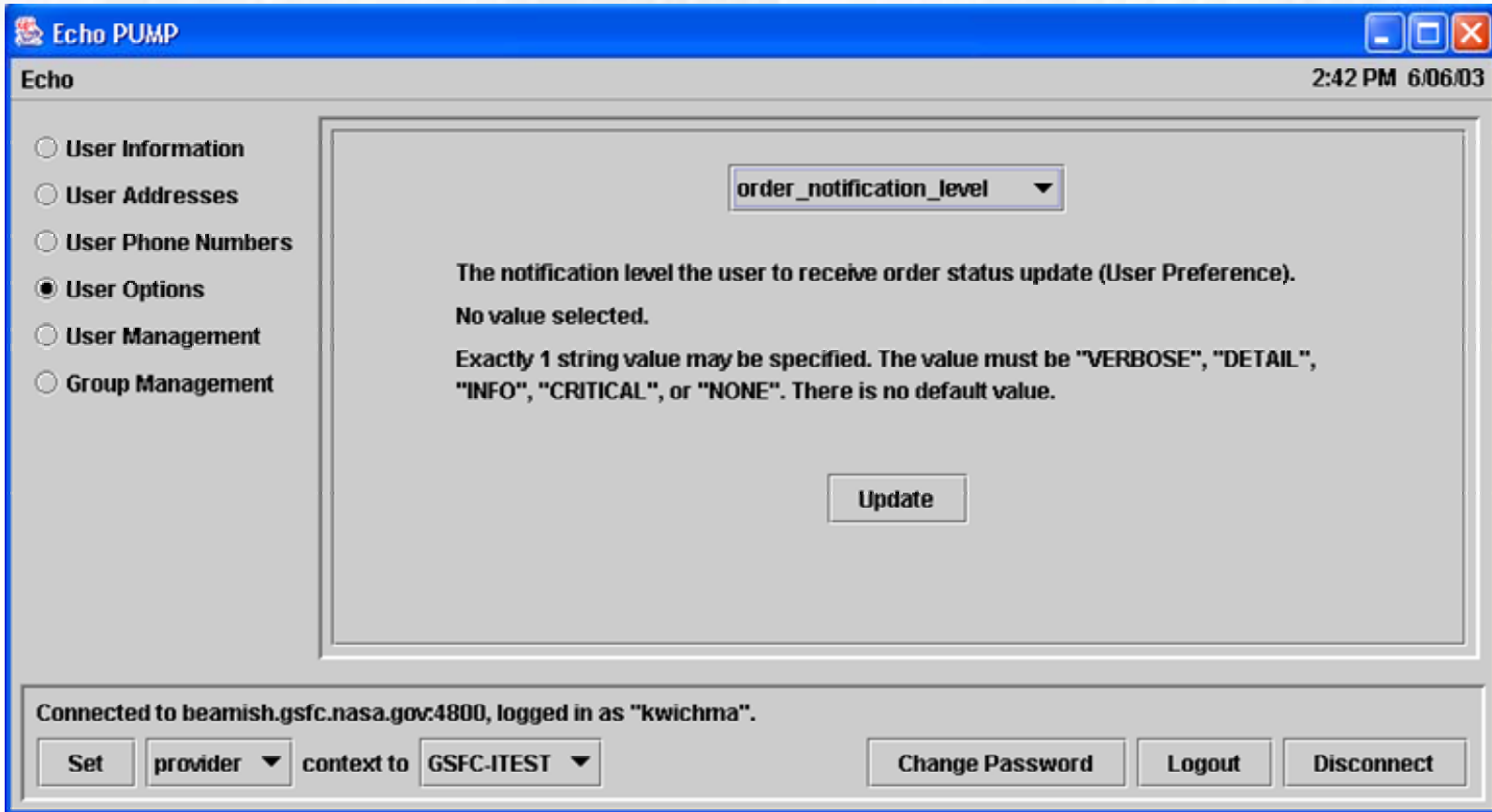
Add Update Delete

Connected to beamish.gsfc.nasa.gov:4800, logged in as "kwichma".

Set provider ▼ context to GSFC-ITEST ▼ Change Password Logout Disconnect



Manage User Options



The screenshot shows the 'Echo PUMP' application window. The title bar includes the application name and standard window controls. The main window has a menu on the left with options: 'User Information', 'User Addresses', 'User Phone Numbers', 'User Options' (selected), 'User Management', and 'Group Management'. The main content area displays a dropdown menu for 'order_notification_level'. Below the dropdown, text explains the notification level preference and lists valid values: 'VERBOSE', 'DETAIL', 'INFO', 'CRITICAL', or 'NONE'. An 'Update' button is positioned below the text. At the bottom, a status bar shows the connection details: 'Connected to beamish.gsfc.nasa.gov:4800, logged in as "kwichma"'. Below this, there are buttons for 'Set', a 'provider' dropdown, a 'context to' dropdown (set to 'GSFC-ITEST'), and buttons for 'Change Password', 'Logout', and 'Disconnect'.

Echo PUMP

Echo 2:42 PM 6/06/03

- ☐ User Information
- ☐ User Addresses
- ☐ User Phone Numbers
- ☒ **User Options**
- ☐ User Management
- ☐ Group Management

order_notification_level ▼

The notification level the user to receive order status update (User Preference).
No value selected.
Exactly 1 string value may be specified. The value must be "VERBOSE", "DETAIL", "INFO", "CRITICAL", or "NONE". There is no default value.

Update

Connected to beamish.gsfc.nasa.gov:4800, logged in as "kwichma".

Set provider ▼ context to GSFC-ITEST ▼ Change Password Logout Disconnect



Set User Options

Echo PUMP 2:43 PM 6/06/03

Echo

- ☐ User Information
- ☐ User Addresses
- ☐ User Phone Numbers
- ☒ **User Options**
- ☐ User Management
- ☐ Group Management

order_notification_level

The notification level the user to receive order status update (User Preference).

Value:

Exactly "CRITICAL" may be specified. The value must be "VERBOSE", "DETAIL", "INFO", "CRITICAL", or "NONE". There is no default value.

Connected to beamish.gsfc.nasa.gov:4800, logged in as "kwichma".

context to



Administrative Functions - Admin Context

The screenshot displays the 'Echo PUMP' application window. The title bar includes the application name and standard Windows window controls. The main window is titled 'Echo' and shows a timestamp of '3:23 PM 6/06/03'. On the left, a sidebar contains a list of administrative functions: 'User Information', 'User Addresses', 'User Phone Numbers', 'User Options', 'User Management' (which is selected with a radio button), and 'Group Management'. The main content area is divided into two sections: 'Users' and 'Administrators'. The 'Users' section has a 'Delete' button followed by a text input field containing the word 'user'. The 'Administrators' section has two rows, each with a button ('Grant' and 'Revoke') followed by the text 'administrative privilege for user' and a text input field. At the bottom of the window, a status bar indicates the connection: 'Connected to beamish.gsfc.nasa.gov:4800, logged in as "kwichma"'. Below this, there are controls for setting the provider and context (currently set to 'GSFC-ITEST'), and buttons for 'Change Password', 'Logout', and 'Disconnect'.

Echo PUMP

Echo 3:23 PM 6/06/03

☐ User Information
☐ User Addresses
☐ User Phone Numbers
☐ User Options
☒ User Management
☐ Group Management

Users

Delete user

Administrators

Grant administrative privilege for user

Revoke administrative privilege for user

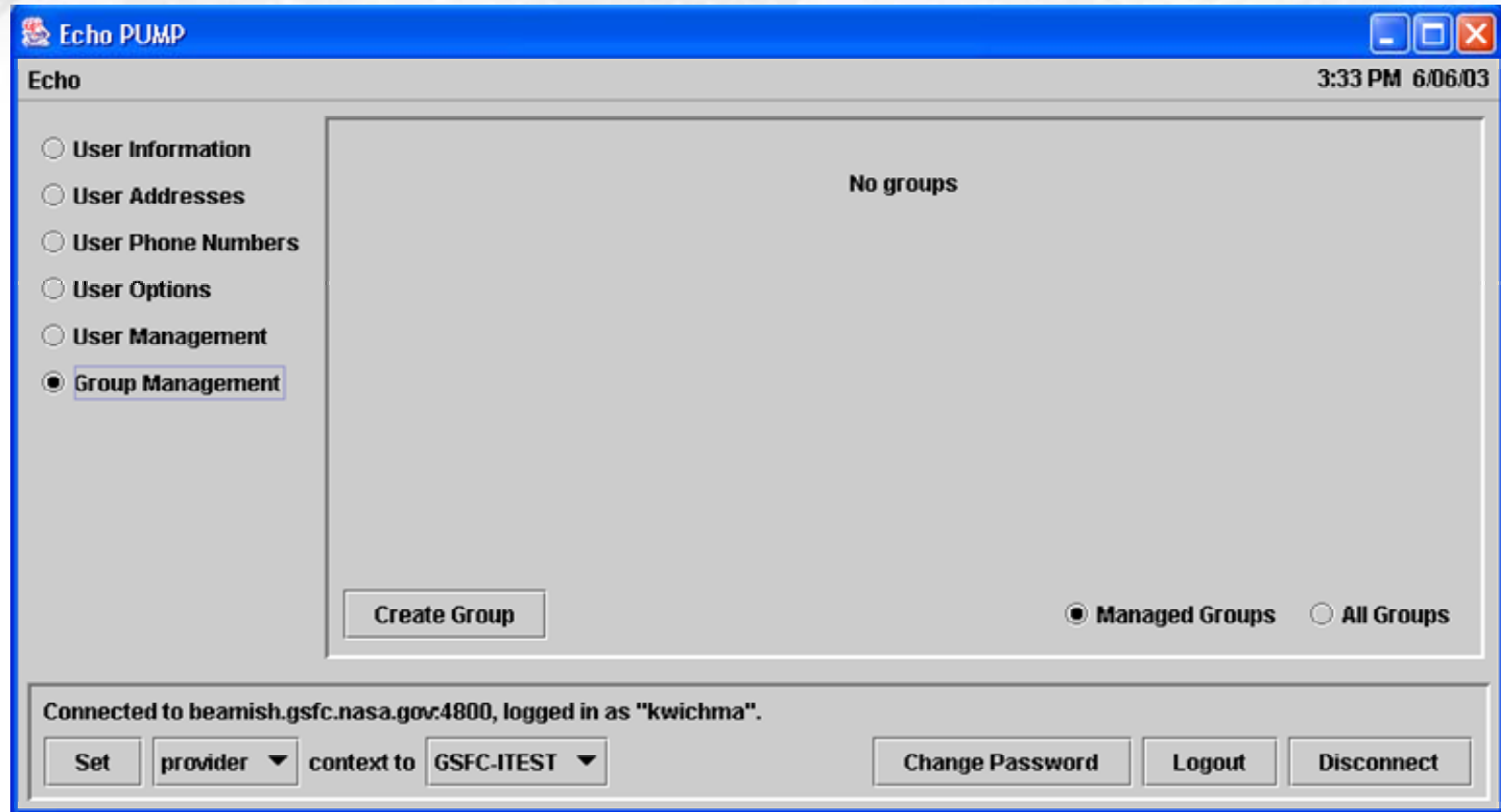
Connected to beamish.gsfc.nasa.gov:4800, logged in as "kwichma".

Set provider context to GSFC-ITEST

Change Password Logout Disconnect



Group Management Functions



Create Group

Echo PUMP

Echo 4:53 PM 6/06/03

☐ User Information
☐ User Addresses
☐ User Phone Numbers
☐ User Options
☐ User Management
☒ **Group Management**

Enter information for new group...

Group Name
QATeam

Description
Quality Assurance Team

Managers (blank separated user names)
kwichma

Create Cancel

Connected to beamish.gsfc.nasa.gov:4800, logged in as "kwichma".

Set provider context to GSFC-ITEST Change Password Logout Disconnect



Group Display - Managers

The screenshot shows the 'Echo PUMP' application window. The title bar includes the application name and standard window controls. The main window has a menu on the left with options: User Information, User Addresses, User Phone Numbers, User Options, User Management, and Group Management (which is selected). The main area displays the 'QA Team' group. It has tabs for 'Managers' and 'Members'. The 'Managers' tab is active, showing 'kwichma (Keith Wichmann)' with a 'Remove' button. Below the list are buttons for 'Add Manager', 'Send Message To Managers', 'Update Description', 'Rename Group', and 'Destroy Group'. At the bottom right of the main area are radio buttons for 'Managed Groups' (selected) and 'All Groups'. A status bar at the bottom shows the connection: 'Connected to beamish.gsfc.nasa.gov:4800, logged in as "kwichma"'. It also includes buttons for 'Set', 'provider', 'context to', 'GSFC-ITEST', 'Change Password', 'Logout', and 'Disconnect'.

Echo PUMP

Echo 4:55 PM 6/06/03

☐ User Information
☐ User Addresses
☐ User Phone Numbers
☐ User Options
☐ User Management
☒ Group Management

QA Team ▼

Quality Assurance Team.

Managers Members

kwichma (Keith Wichmann) Remove

Add Manager Send Message To Managers

Update Description Rename Group Destroy Group

Create Group

☒ Managed Groups ☐ All Groups

Connected to beamish.gsfc.nasa.gov:4800, logged in as "kwichma".

Set provider ▼ context to GSFC-ITEST ▼ Change Password Logout Disconnect



Group Display - Members

The screenshot displays the Echo PUMP web application interface. The title bar shows "Echo PUMP" and standard window controls. The main header area includes the text "Echo" on the left and the timestamp "5:13 PM 6/06/03" on the right. A left-hand navigation menu contains several radio buttons: "User Information", "User Addresses", "User Phone Numbers", "User Options", "User Management", and "Group Management" (which is selected). The main content area features a dropdown menu set to "QATeam". Below this is a section titled "Quality Assurance Team." with two tabs, "Managers" and "Members". The "Members" tab is active, showing an empty list box. Below the list box are five buttons: "Add Member", "Send Message To Members", "Remove All Members", "Update Description", and "Rename Group". At the bottom of the main content area is a "Create Group" button and two radio buttons for "Managed Groups" (selected) and "All Groups". A status bar at the bottom indicates the connection: "Connected to beamish.gsfc.nasa.gov:4800, logged in as 'kwichma'". It also includes a "Set" button, a "provider" dropdown menu, a "context to" dropdown menu set to "GSFC-ITEST", and three buttons: "Change Password", "Logout", and "Disconnect".



Group Management - Add Member

The screenshot shows a Windows-style dialog box titled "Echo PUMP". The main window has a title bar with standard minimize, maximize, and close buttons. Below the title bar, the text "Echo" is on the left and "5:13 PM 6/06/03" is on the right. The main area contains a list of radio buttons on the left: "User Information", "User Addresses", "User Phone Numbers", "User Options", "User Management", and "Group Management" (which is selected). To the right of these buttons is a large text area with the prompt "Enter user name to add as member of group 'QATeam'...". Below this prompt is a text input field labeled "User Name" containing the text "kwichma". To the right of the input field is a checked checkbox labeled "Notify". At the bottom of the text area are two buttons: "Add" and "Cancel". At the very bottom of the dialog box, there is a status bar that reads "Connected to beamish.gsfc.nasa.gov:4800, logged in as 'kwichma'". Below this status bar are several controls: a "Set" button, a "provider" dropdown menu, the text "context to", a "GSFC-ITEST" dropdown menu, a "Change Password" button, a "Logout" button, and a "Disconnect" button.

Echo PUMP

Echo 5:13 PM 6/06/03

☐ User Information
☐ User Addresses
☐ User Phone Numbers
☐ User Options
☐ User Management
☒ Group Management

Enter user name to add as member of group "QATeam"...

User Name
kwichma

☒ Notify

Add Cancel

Connected to beamish.gsfc.nasa.gov:4800, logged in as "kwichma".

Set provider context to GSFC-ITEST Change Password Logout Disconnect



Provider Context - Account Description and Roles

The screenshot shows the Echo PUMP application window. The title bar reads "Echo PUMP" and the status bar shows "5:16 PM 6/06/03". On the left is a sidebar with a list of menu items: User Information, User Addresses, User Phone Numbers, User Options, User Management, Group Management, Provider Information (selected), Provider Contacts, Provider Policies, and Data Management. The main content area is divided into two sections. The "Account" section displays "GSFC-ITEST" and "ECHO Provider Organization" with an "Update" button. The "Context" section contains two rows, each with a button ("Grant" or "Revoke") and a text field labeled "provider context privilege for user". At the bottom, a status bar indicates the connection: "Connected to beamish.gsfc.nasa.gov:4800, logged in as 'kwichma', provider context is 'GSFC-ITEST'". Below this are three buttons: "Leave Provider Context", "Logout", and "Disconnect".

Echo PUMP

Echo 5:16 PM 6/06/03

- ☐ User Information
- ☐ User Addresses
- ☐ User Phone Numbers
- ☐ User Options
- ☐ User Management
- ☐ Group Management
- ☒ Provider Information
- ☐ Provider Contacts
- ☐ Provider Policies
- ☐ Data Management

Account

GSFC-ITEST
ECHO Provider Organization

Update

Context

Grant provider context privilege for user

Revoke provider context privilege for user

Connected to beamish.gsfc.nasa.gov:4800, logged in as "kwichma", provider context is "GSFC-ITEST".

Leave Provider Context Logout Disconnect



Manage Provider Contacts - Provider Context

The screenshot shows the 'Echo PUMP' web application. The title bar includes the application name and standard window controls. The main header area displays 'Echo' on the left and the timestamp '5:16 PM 6/06/03' on the right. A left-hand navigation menu contains several radio buttons: 'User Information', 'User Addresses', 'User Phone Numbers', 'User Options', 'User Management', 'Group Management', 'Provider Information', 'Provider Contacts' (which is selected), 'Provider Policies', and 'Data Management'. The main content area features a dropdown menu labeled 'default contact' with a downward arrow. Below this, the contact details for 'Joe Contact' are displayed: '123 Main Street', 'Anytown, FL 22222 USA', '+US (111) 222-3333 x444', and 'foo@bar.com'. At the bottom of this section are three buttons: 'Add', 'Update', and 'Delete'. A status bar at the very bottom provides connection information: 'Connected to beamish.gsfc.nasa.gov:4800, logged in as "kwichma", provider context is "GSFC-ITEST"'. Below this status bar are three buttons: 'Leave Provider Context', 'Logout', and 'Disconnect'.

Echo PUMP

Echo 5:16 PM 6/06/03

☐ User Information

☐ User Addresses

☐ User Phone Numbers

☐ User Options

☐ User Management

☐ Group Management

☐ Provider Information

☒ Provider Contacts

☐ Provider Policies

☐ Data Management

default contact ▼

Joe Contact

123 Main Street
Anytown, FL 22222 USA

+US (111) 222-3333 x444

foo@bar.com

Add Update Delete

Connected to beamish.gsfc.nasa.gov:4800, logged in as "kwichma", provider context is "GSFC-ITEST".

Leave Provider Context Logout Disconnect



Provider Policies

- **For each of submit, quote, cancel**
 - Is it supported?
 - What message format?
 - ODL via sockets vs. XML via SOAP
 - Where to send the message?
 - Number of times to retry message send
 - Number of seconds to wait between retries



Provider Policies - Provider Context

The screenshot shows the Echo PUMP web application interface. The title bar reads "Echo PUMP". The main content area is titled "Echo" and shows a sidebar with a list of configuration categories: User Information, User Addresses, User Phone Numbers, User Options, User Management, Group Management, Provider Information, Provider Contacts, **Provider Policies** (selected), and Data Management. The main panel displays the "submit" dropdown menu. Below it, the text "The provider submit setting (Communication Setting)." is shown. A tabbed interface has four tabs: "submit_retry_attempts" (selected), "submit_retry_wait", "supported", and "message_type". The selected tab shows the text "The max attempts of submit retry (Communication Setting). Value: 3" and a description: "Exactly 1 integer value may be specified. The value must be in the range from 1 to 1000. There is no default value." An "Update" button is at the bottom of the main panel. The status bar at the bottom shows "Connected to beamish.gsfc.nasa.gov:4800, logged in as 'kwichma', provider context is 'GSFC-ITEST'." and includes buttons for "Leave Provider Context", "Logout", and "Disconnect".

Echo PUMP

Echo 5:19 PM 6/06/03

☐ User Information
☐ User Addresses
☐ User Phone Numbers
☐ User Options
☐ User Management
☐ Group Management
☐ Provider Information
☐ Provider Contacts
☒ Provider Policies
☐ Data Management

submit ▼

The provider submit setting (Communication Setting).

submit_retry_attempts submit_retry_wait supported message_type

The max attempts of submit retry (Communication Setting).
Value: 3
Exactly 1 integer value may be specified. The value must be in the range from 1 to 1000. There is no default value.

Update

Connected to beamish.gsfc.nasa.gov:4800, logged in as "kwichma", provider context is "GSFC-ITEST".

Leave Provider Context Logout Disconnect



Set Provider Policies - Retries - Provider Context

The screenshot shows the 'Echo PUMP' application window. The title bar includes the application name and standard window controls. The main window has a sidebar on the left with a list of configuration categories: User Information, User Addresses, User Phone Numbers, User Options, User Management, Group Management, Provider Information, Provider Contacts, **Provider Policies** (selected), and Data Management. The main content area is titled 'submit' and contains the text 'The provider submit setting (Communication Setting)'. Below this, there are four tabs: 'submit_retry_attempts' (selected), 'submit_retry_wait', 'supported', and 'message_type'. The selected tab displays a text input field with the value '3' and a 'Clear' button. Below the input field, a message states: 'Exactly 1 integer value may be specified. The value must be in the range from 1 to 1000. There is no default value.' At the bottom of the main content area are 'Update' and 'Cancel' buttons. A status bar at the very bottom of the window shows the connection status: 'Connected to beamish.gsfc.nasa.gov:4800, logged in as "kwichma", provider context is "GSFC-ITEST"'. Below this status bar are three buttons: 'Leave Provider Context', 'Logout', and 'Disconnect'.

Echo PUMP

Echo 5:20 PM 6/06/03

☐ User Information
☐ User Addresses
☐ User Phone Numbers
☐ User Options
☐ User Management
☐ Group Management
☐ Provider Information
☐ Provider Contacts
☒ Provider Policies
☐ Data Management

submit

The provider submit setting (Communication Setting).

submit_retry_attempts submit_retry_wait supported message_type

The max attempts of submit retry (Communication Setting).

Value: 3

Exactly 1 integer value may be specified. The value must be in the range from 1 to 1000. There is no default value.

Clear

Update Cancel

Connected to beamish.gsfc.nasa.gov:4800, logged in as "kwichma", provider context is "GSFC-ITEST".

Leave Provider Context Logout Disconnect



Set Provider Policies - Message Type - Provider Context

The screenshot shows the 'Echo PUMP' application window. The title bar includes the application name and standard window controls. The top status bar shows the time '5:21 PM' and date '6/06/03'. On the left is a sidebar menu with the following items: 'User Information', 'User Addresses', 'User Phone Numbers', 'User Options', 'User Management', 'Group Management', 'Provider Information', 'Provider Contacts', 'Provider Policies' (which is selected), and 'Data Management'. The main content area is titled 'submit' and contains the following elements:

- A sub-header: 'The provider submit setting (Communication Setting).'
- Four tabs: 'submit_retry_attempts', 'submit_retry_wait', 'supported', and 'message_type' (which is selected).
- A description: 'The message type of the queue, either soap or odl (Communication Setting).'
- Two radio buttons: 'ecs' and 'soap' (which is selected).
- A nested box titled 'Soap message queue (Communication Setting)' containing:
 - Three tabs: 'targetmethod', 'targetobject', and 'url' (which is selected).
 - A description: 'Target method to be called (Communication Setting).'
 - A text input field with the value 'perform'.
 - A note: 'Exactly 1 string value may be specified. No validation information is available. There is no default value.'
- A 'Clear' button at the bottom right of the nested box.
- 'Update' and 'Cancel' buttons at the bottom of the main content area.

At the bottom of the window, a status bar displays the text: 'Connected to beamish.gsfc.nasa.gov:4800, logged in as "kwichma", provider context is "GSFC-ITEST"'. Below this text are three buttons: 'Leave Provider Context', 'Logout', and 'Disconnect'.



Data Management (ACL) - Provider Context

The screenshot shows the Echo PUMP application window. The title bar reads "Echo PUMP". The main window has a menu on the left with options: User Information, User Addresses, User Phone Numbers, User Options, User Management, Group Management, Provider Information, Provider Contacts, Provider Policies, and Data Management (which is selected). The main area has two tabs: "Rules" (selected) and "Conditions". Under the "Rules" tab, there is a dropdown menu showing "DMS-CREATECONDITION-RULE". Below this, the text reads: "Rule to enforce the condition DMS-CREATECONDITION-CONDITION for test DMS-CREATECONDITION. Restrict viewing of collection 'MODIS/Terra Calibrated Radiances 5-Min L1B Swath 250m V003' and its granules." At the bottom of this section are "Add" and "Delete" buttons. The status bar at the bottom of the window displays: "Connected to beamish.gsfc.nasa.gov:4800, logged in as 'kwichma', provider context is 'GSFC-ITEST'." and includes "Leave Provider Context", "Logout", and "Disconnect" buttons.

Echo PUMP

Echo 5:25 PM 6/06/03

☐ User Information
☐ User Addresses
☐ User Phone Numbers
☐ User Options
☐ User Management
☐ Group Management
☐ Provider Information
☐ Provider Contacts
☐ Provider Policies
☒ Data Management

☒ Rules ☐ Conditions

DMS-CREATECONDITION-RULE ▼

Rule to enforce the condition DMS-CREATECONDITION-CONDITION for test DMS-CREATECONDITION.

Restrict viewing of collection "MODIS/Terra Calibrated Radiances 5-Min L1B Swath 250m V003" and its granules.

Add Delete

Connected to beamish.gsfc.nasa.gov:4800, logged in as "kwichma", provider context is "GSFC-ITEST".

Leave Provider Context Logout Disconnect



Create a Restriction - ACL - Provider Context

Echo PUMP

Echo 5:27 PM 6/06/03

☐ User Information
☐ User Addresses
☐ User Phone Numbers
☐ User Options
☐ User Management
☐ Group Management
☐ Provider Information
☐ Provider Contacts
☐ Provider Policies
☒ Data Management

☒ Rules ☐ Conditions

Rule Name
Protect30days

Description
Hide data for the first 30 days after it is produced

Rule
Restrict viewing of collection MOD05 granules
that are greater than 30 days old.

Add Cancel

Connected to beamish.gsfc.nasa.gov:4800, logged in as "kwichma", provider context is "GSFC-ITEST".

Leave Provider Context Logout Disconnect

Create a Permission - ACL - Provider Context

The screenshot shows the 'Echo PUMP' application window. The title bar includes the application name and standard window controls. The main window has a sidebar on the left with a list of menu items: User Information, User Addresses, User Phone Numbers, User Options, User Management, Group Management, Provider Information, Provider Contacts, Provider Policies, and Data Management (which is selected). The main area is titled 'Echo' and shows a timestamp of '5:28 PM 6/06/03'. It contains two tabs: 'Rules' (selected) and 'Conditions'. The 'Rules' tab has a 'Rule Name' field with the text 'QATeamVisibility' and a 'Description' field with the text 'Grant viewing rights to QA team'. Below these is a 'Rule' section with a dropdown menu set to 'Permit'. The rule is defined as 'viewing of collection MOD05 granules for group QATeam that are greater than 30 days old.' There are 'Add' and 'Cancel' buttons at the bottom of the rule section. At the very bottom of the window, a status bar indicates the connection: 'Connected to beamish.gsfc.nasa.gov:4800, logged in as "kwichma", provider context is "GSFC-ITEST"'. There are three buttons at the bottom: 'Leave Provider Context', 'Logout', and 'Disconnect'.

Echo PUMP

Echo 5:28 PM 6/06/03

☐ User Information
☐ User Addresses
☐ User Phone Numbers
☐ User Options
☐ User Management
☐ Group Management
☐ Provider Information
☐ Provider Contacts
☐ Provider Policies
☒ Data Management

☒ Rules ☐ Conditions

Rule Name
QATeamVisibility

Description
Grant viewing rights to QA team

Rule
Permit viewing of collection MOD05 granules
for group QATeam that are greater than 30 days old.

Add Cancel

Connected to beamish.gsfc.nasa.gov:4800, logged in as "kwichma", provider context is "GSFC-ITEST".

Leave Provider Context Logout Disconnect



Restriction Options - ACL - Provider Context

Echo PUMP

Echo 5:30 PM 6/06/03

☐ User Information
☐ User Addresses
☐ User Phone Numbers
☐ User Options
☐ User Management
☐ Group Management
☐ Provider Information
☐ Provider Contacts
☐ Provider Policies
☒ Data Management

☒ Rules ☐ Conditions

Rule Name
QATeamVisibility

Description
Grant viewing rights to QA team

Rule

Restrict viewing of all collections and their granules

uncond

Add

all collections and their granules
all collection granules
collection
all granules
granule

Connected to beamish.gsfc.nasa.gov:4800, logged in as "kwichma", provider context is "GSFC-ITEST".

Leave Provider Context Logout Disconnect



Condition Options - ACL - Provider Context

Echo PUMP

Echo 5:31 PM 6/06/03

- ☐ User Information
- ☐ User Addresses
- ☐ User Phone Numbers
- ☐ User Options
- ☐ User Management
- ☐ Group Management
- ☐ Provider Information
- ☐ Provider Contacts
- ☐ Provider Policies
- ☒ Data Management

☒ Rules ☐ Conditions

Rule Name
QATeamVisibility

Description
Grant viewing rights to QA team

Rule

Restrict viewing of collection MOD05 granules

that are greater than hours old.

that are greater than
that are less than
that are within
that are outside

Cancel

Connected to beamish.gsfc.nasa.gov:4800, logged in as "kwichma", provider context is "GSFC-ITEST".

Leave Provider Context Logout Disconnect



Fixed Temporal Range Restriction Example

Echo PUMP

Echo 5:32 PM 6/06/03

☐ User Information
☐ User Addresses
☐ User Phone Numbers
☐ User Options
☐ User Management
☐ Group Management
☐ Provider Information
☐ Provider Contacts
☐ Provider Policies
☒ Data Management

☒ Rules ☐ Conditions

Rule Name
QATeamVisibility

Description
Grant viewing rights to QA team

Rule

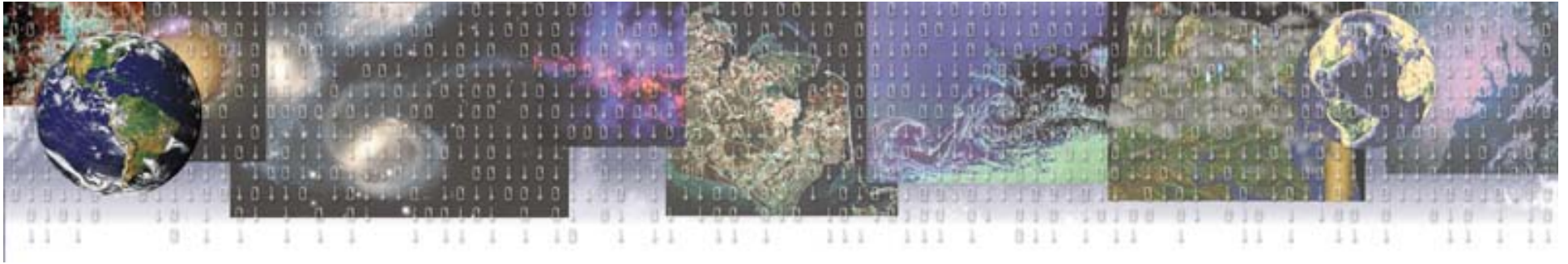
Restrict viewing of collection MOD05 granules
that are within JANUARY 1, 1970 to JANUARY 1, 1970

Add Cancel

Connected to beamish.gsfc.nasa.gov:4800, logged in as "kwichma", provider context is "GSFC-ITEST".

Leave Provider Context Logout Disconnect

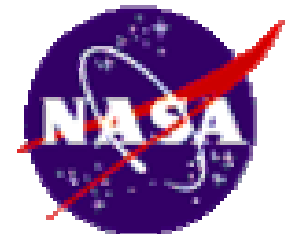




Metadata Reconciliation



Global Science & Technology, Inc.



Primary Issues

- ECHO represents data held at the data providers
- The update mechanism will be imperfect
- What are the mechanisms for determining when there is a difference between the data provider and ECHO?
- What are the mechanisms for correcting problems?



Discrepancy Detection

- **Monitor ingest reports from ECHO**
 - Were there errors?
 - Did ingest occur? (i.e. was there something sent and ECHO didn't get it?)
- **Compare counts**
 - Query ECHO for number of granules per collection and compare to data provider
 - Remember that there is always a delay in updating ECHO
- **Examine valids**
 - Query ECHO for extent of valids and compare to data provider
- **Compare holdings**
 - Query ECHO for a list of GranuleURs along with last update time and compare to data provider

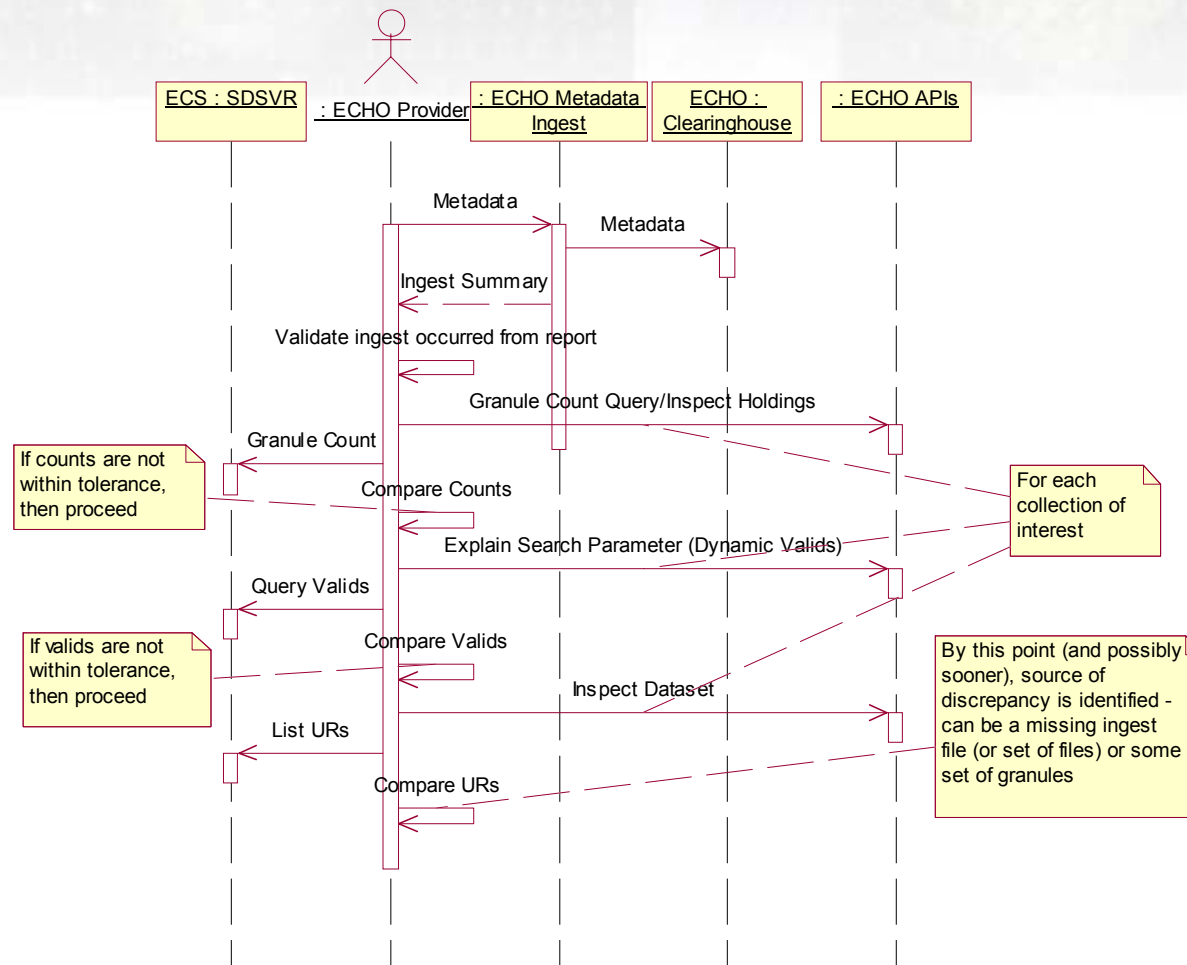


Discrepancy Sources

- **ECHO is missing ingest files**
 - Export not run correctly
 - Addressed by proper configuration
 - Failure to deliver exported file
 - Addressed by monitoring delivery mechanism
 - Failure of ECHO to recognize and process exported file
 - Addressed by ECHO OPs monitoring ingest
- **ECHO is missing granules, or they are incorrect**
 - Problem with export program
 - Addressed by BMGT validation approaches
 - Problem with ECHO ingest
 - Addressed by internal and external tests of ECHO
 - Problem with ECHO query/results
 - Addressed by internal and external tests of ECHO



Discrepancy Detection



Approach for 4.5

- **Perform query yourself**
 - or-
- **Ask Operations Team to create a report for you**



Improvements for 5.0

- **ExplainSearchParameter transaction**
 - Sometimes referred to as dynamic valids
 - Used to determine what search attributes will return results given a query
 - i.e. What Platforms are valid if I search for an area equivalent to Maryland and limit my search to LPDAAC and GSFC?



5.5 Improvements

- **Inspection functions**

- InspectHoldings
 - Lists all collections and number of granules in collection
 - Useful for high level check
 - Result returned inline
- InspectDataset
 - Lists GranuleUR, Provider last update time, ECHO last update time
 - Uses simple delimited format
 - Can be returned inline, sent by email (compressed), or put on FTP site

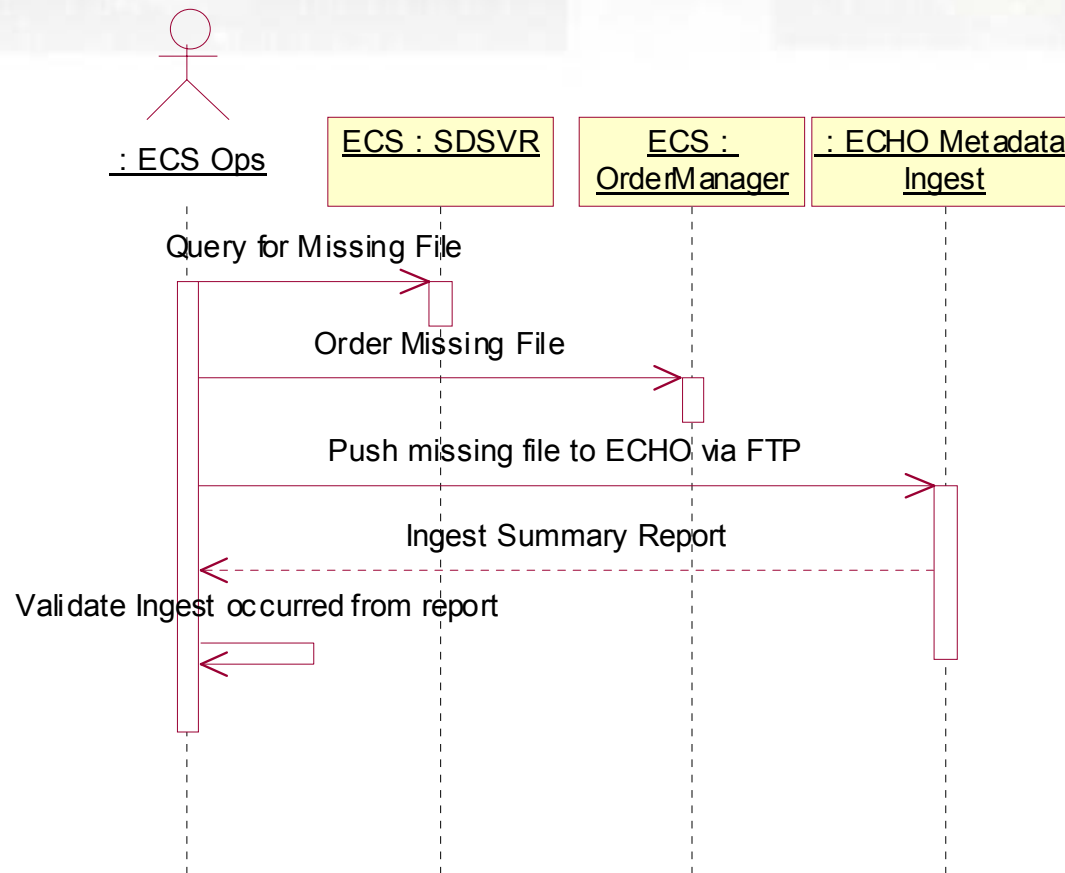


Reconciliation Options

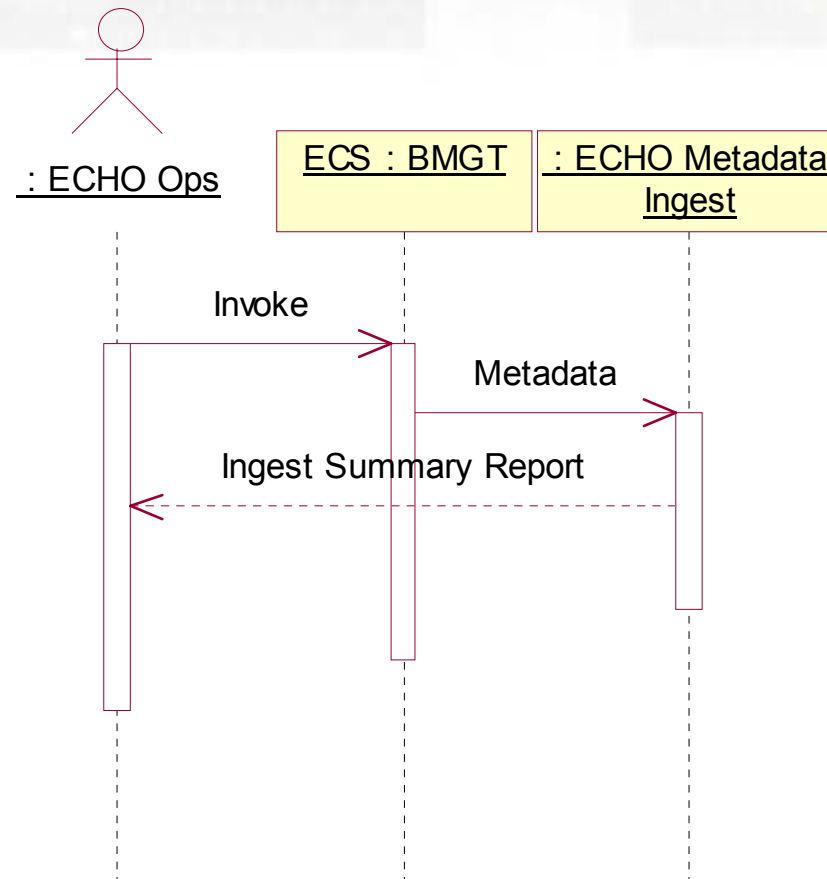
- Identify missing file and submit for ingest
- Create deletion list and submit
- Export missing data and submit for ingest
- Fix mapping issue and...
 - Have operations fix in current archive, and adjust export/mapping/ingest appropriately
 - or-
 - Perform update of just changed metadata
 - or-
 - Delete all data and re-ingest



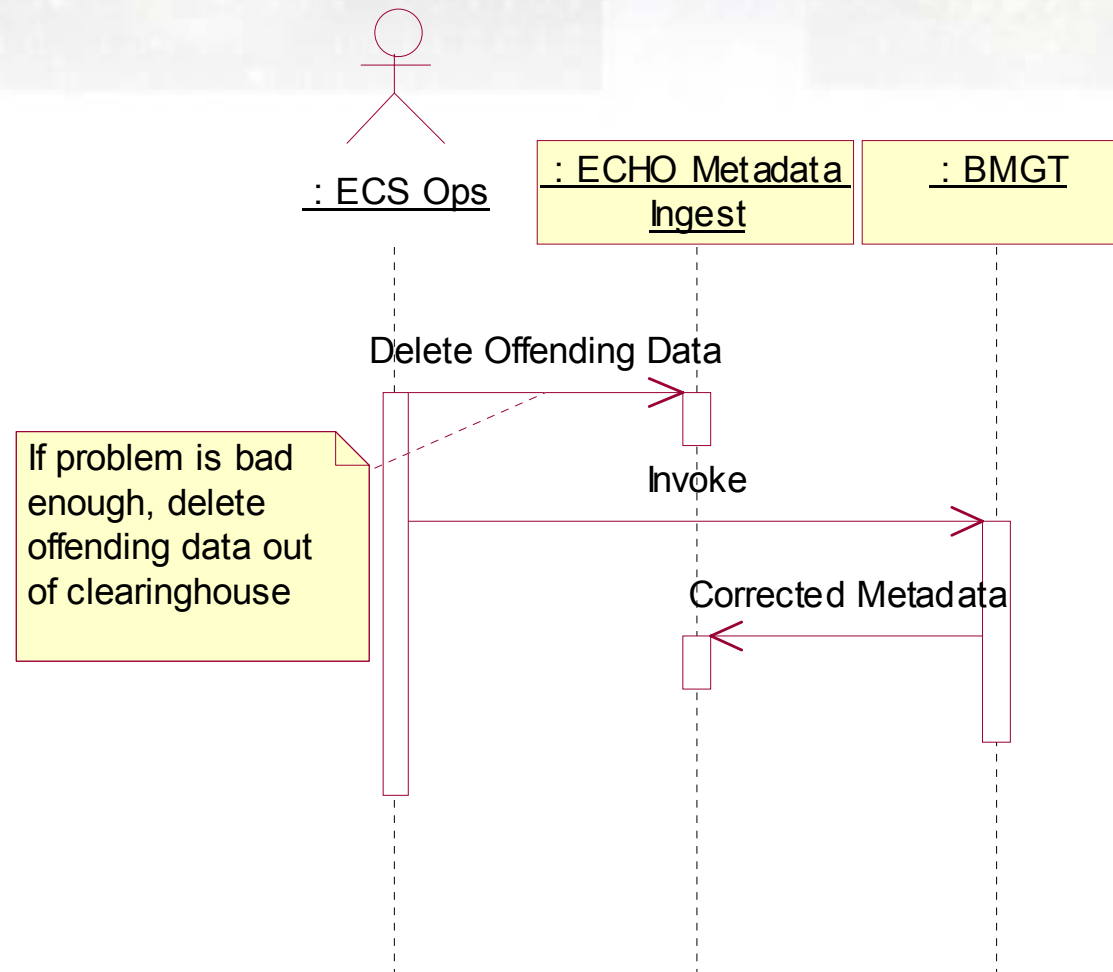
Metadata Reconciliation - Missing File(s)



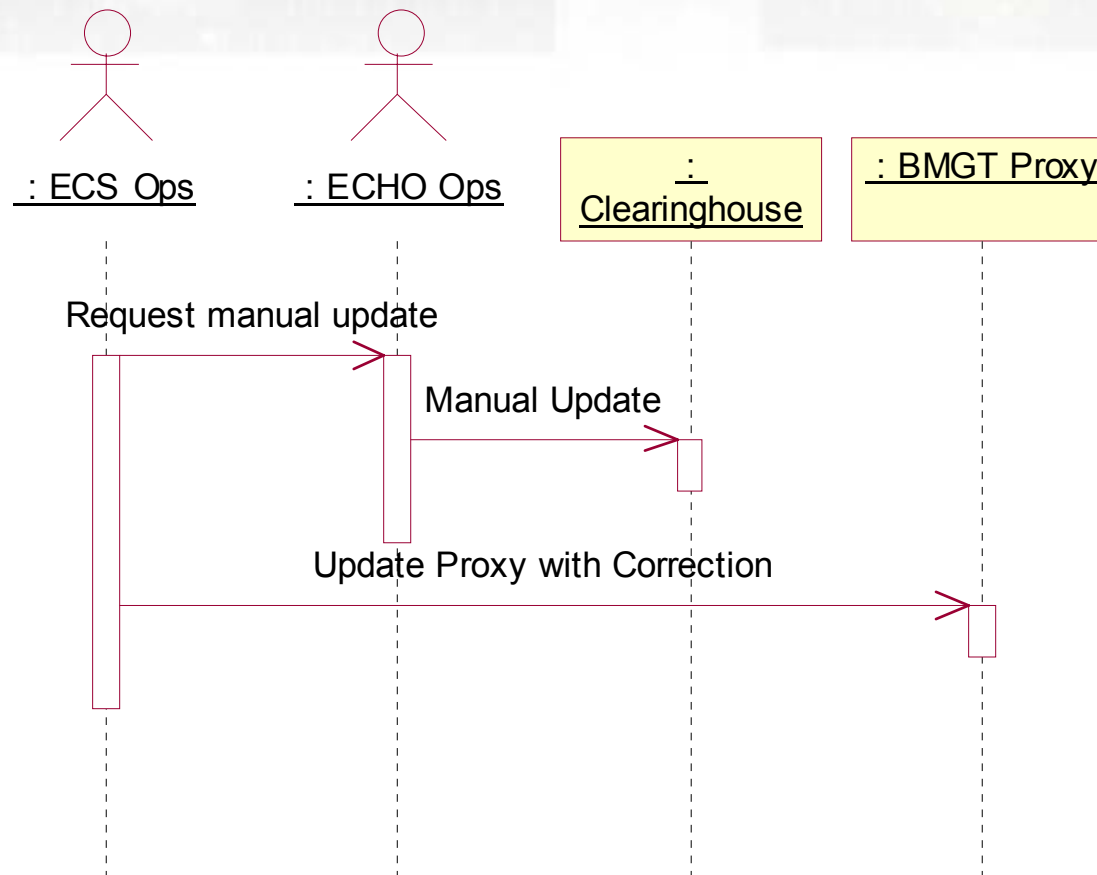
Metadata Reconciliation - Missing Granules

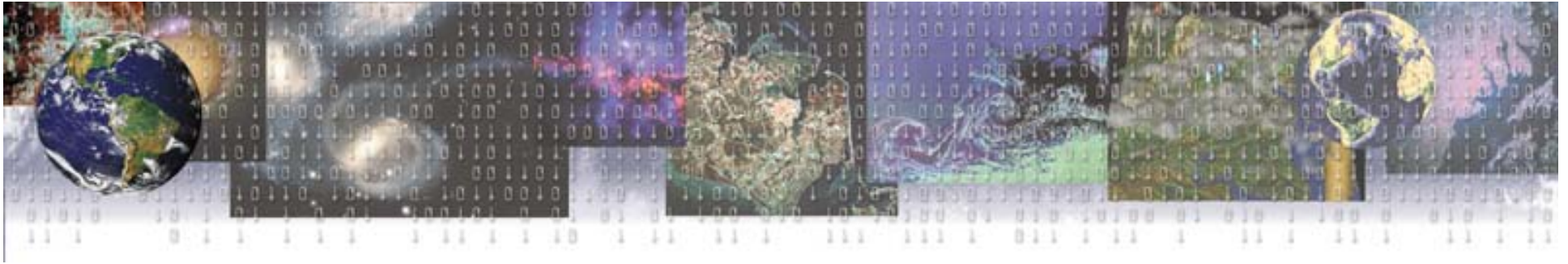


Metadata Reconciliation - Erroneous Granules



Metadata Reconciliation - Erroneous Granules (2)

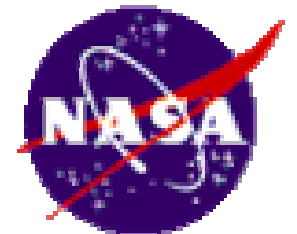




ECHO Test Systems



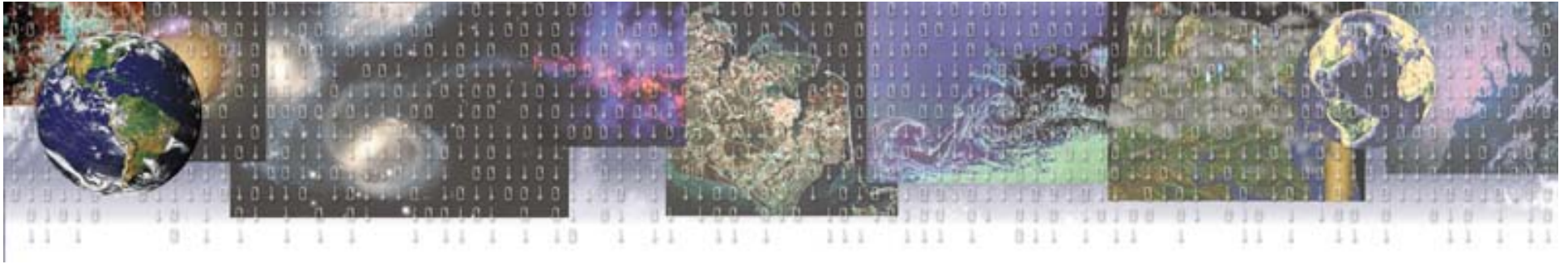
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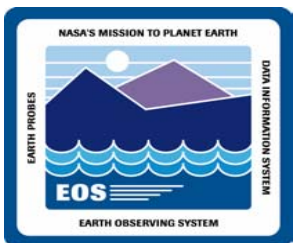
ECHO Instances

<u>Previous Operational Version</u>	<u>Operational Version</u>	<u>External Test Version</u>
Legacy System Real Providers, Real Data, No ingest	Operational System Real Providers, Real Data, Ingest Activated	External Test System Dummy Providers, Test Data, Ingest Activated
	Provider Test System TSMODE Providers, Real TSMODE Data, Ingest Activated	Client Test System Dummy Providers, Test Data, No Ingest
	Client Test System Dummy Providers, Real Data + Test Data, No Ingest	

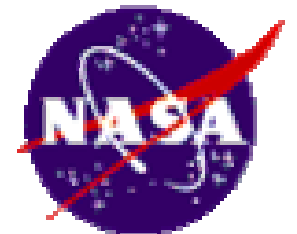




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5 Sources of Downtime In ECHO

1. **Hardware Error**
2. **Software Error**
3. **Reconfiguration**
4. **Backups**
5. **Logs fill up the disk space**



Hardware Error

- **Occurs infrequently**
- **Has not happened since system went operational**
- **Requires hardware be fixed and/or replaced**
 - Typically a service call to Sun
 - Downtime of a day or two anticipated
- **Being addressed through introduction of clustered system**
 - This introduces redundancy in hardware with failover and load balancing capabilities.



Software Error

- **Occurs infrequently**
- **Has not happened since system went operational.**
 - Requires restarts of software.
- **Downtime is minutes once discovered (if someone is around to restart the system)**
- **Addressed through thorough testing and a robust environment**
 - Could be augmented by writing "nanny" script to watch system and restart it automatically.



Reconfiguration

- Occurs when certain system parameters have to be changed
- This is estimated to have happened on average about once a month.
- Downtime is minutes when it occurs.
- Being addressed by new versions of the system performing functions without need of system restart.



Backups

- **Occur weekly on Friday nights**
- **Downtime is roughly 4-5 hours once per week**
- **Being addressed by adding hot backup capability**
 - This should reduce downtime considerably
 - System will be limited to read-only functions for an estimated less than hour time period



Logs Fill Up Disk Space

- Occurs when logs fill up allocated file system space
- This happened about 4-5 times since the system went operational and has now been corrected
- Downtime is minutes
- Addressed by reducing log file output, and changing how log files are managed to not require restart
 - Some still require restart

